

SUPPORT FOR THE AMENDMENTS

Claims 1-16 are herein canceled.

Claims 17-39 are new and are supported by the original claims as follows:

<u>New Claim</u>	<u>Original Claim</u>
17	9
18	1,9
19	2
20	4
21	5
22	6
23	8
24	11
25	12
26	13
27	15
28	16
29	10
30	1,10
31	2
32	4
33	5
34	6
35	8
36	11
37	12
38	13
39	14

No new matter is added to this application by entry of these amendments.

Claims 17-39 are active.

REMARKS/ARGUMENTS

The claimed invention provides a process to prepare a vinyl aromatic copolymer reinforced with rubbery particles according to Claims 17 and 29 and the reinforced vinyl aromatic polymer made thereby. The rubber reinforced vinyl aromatic copolymer according to the claimed invention has good physical-mechanical properties as indicated by gloss and impact resistance, and can be produced with standard polymer production equipment by a method which is more efficient and economical in comparison to conventional methods.

Applicants respectfully note that Claims 1-16 are herein canceled and replaced with new Claims 17-39. The rejections of record are addressed in the following with respect to the new claims as the rejections are moot in view of the cancelation of the original claims.

The rejection of Claims 1-3 and 7, 4-8 and 9-16 under 35 U.S.C. 103(a) over Echte et al. (U.S. 4,493,922) as evidence by Kasahara et al. (U.S. 5039,714) and further, in view of Demirors et al. (U.S. 6,545,090) is respectfully traversed.

Echte describes a thermoplastic molding material containing polystyrene as the matrix and dispersed in the matrix, two particle types differing in size and morphology (Abstract). The reference describes production of the molding material either by a blending method (Example 1) or by preparation of two prepolymer mixtures and mixing them to complete polymerization (Example 3).

Kasahara is cited to show the conventional understanding for “salami” particles.

Nowhere does either reference disclose or suggest polymerization of a monomer solution containing both types of reinforcing particles and nowhere does the primary reference disclose, suggest or provide motivation that would have led one of ordinary skill in the art, at the time of the invention to the solubility parameter relationship:

$$\delta_1 - \delta_2 \geq 0.5$$

recited in Claims 17 and 29 of the present invention.

In contrast, Applicants have surprisingly discovered that a rubber reinforced vinyl aromatic (co)polymer having a strictly bimodal morphology of reinforcing particles can be obtained by a single polymerization of vinyl aromatic monomer(s) when the rubber components are both dissolved in the monomer solution. A “strictly bimodal morphology” is defined as exclusively having two classes of particles of differing size and morphology (page 1, line 14, and bridging to page 2). Applicants have discovered that such morphology can be obtained if the relationship of solubility parameters of the rubber elastomers of the capsule and “salami” particles satisfies the above relationship.

The Office has acknowledged that Echte is silent regarding a process as described in Claim 9 (now Claim 17) (Official Action dated May 29, 2009, page 7, lines 14-15) and alleges that Demirors shows such a process. Demirors describes a continuous process for preparing a rubber reinforced vinyl aromatic (co)polymer wherein the reinforcing material contains rubber particles having a high molecular weight component and a low molecular weight component (Abstract, Claim 1). Nowhere does this reference disclose or suggest a solubility parameter relationship as a criterion for selecting the two particle compositions and the importance of such relationship to obtaining a strictly bimodal morphology of the particles in the reinforced vinyl aromatic copolymer.

The Office has acknowledged that neither Echte nor Demirors discloses the solubility parameter relationship of the present invention. However, the Office alleges that such parameter are intrinsic to the capsule and salami particles (Official Action dated May 29, 2009, page 7, lines 14-15).

Applicants agree that all particle compositions will have a specific solubility parameter, but respectfully disagree that the solubility difference shown in the recited relationship is intrinsic to capsule and salami morphologies. Applicants respectively submit

that such speculation has no support in the cited references. Applicants submit that a very broad range of solubility parameters are available depending on the chemical composition of the particle and that operating with solubility parameters which do not satisfy the claimed relationship, does not provide the desired results.

Applicants further submit that Demirors does not disclose or suggest a strictly bimodal morphology as according to the claimed invention. Demirors describes the molecular weights of the components in terms of weight average molecular weight (Col. 2, lines 24-28) and therefore does not suggest or provide motivation that would have led one of ordinary skill in the art, at the time of the present invention to the relationship based on solubility parameters.

Applicants note that in reversing an obviousness rejection in *Ex parte* SUSUMU TANAKA and YASUO MURAKAMI (Appeal 2007-3845; Decided: March 28, 2008) the Board of Patent Appeals and Interferences stated:

In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)

As discussed above, Applicants respectfully submit that the cited combination of references do not describe or suggest each and every limitation of the claimed invention and therefore, the a conclusion of obviousness over the cited references cannot be supported. Accordingly, Applicants respectfully submit that the presently claimed invention according to Claims 17-39 is patentable over the combination of Echte, Demirors and Kasahara.

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Reply to Office Action of May 29, 2009

Applicants respectfully submit that the above-identified application is now in
condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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